

REDESCRIPTION OF *STENOSTYGNUS PUSIO* SIMON AND SYNONYMY OF CARIBBIANTINAE WITH STENOSTYGNINAE (OPILIONES: LANIATORES, Biantidae)

Ricardo Pinto-da-Rocha: Museu de Zoologia, Universidade de São Paulo, Caixa Postal 7172, São Paulo, SP, Brazil, 01064-970

ABSTRACT. Based on the lack of the tarsal process and genitalic features, *Stenostygnus pusio* Simon 1879 is transferred from the Stygnidae to the Biantidae. This is the first record of the family Biantidae from Brazil, Colombia and Ecuador. The subfamily Caribbiantinae is synonymized with Stenostygninae. Genera and species other than *Stenostygnus pusio*, formerly placed in the Stenostygninae are transferred to Heterostygninae (Stygnidae). The convergences between Stygnidae and Biantidae are presented and discussed.

Stenostygnus pusio Simon 1879 was described based on a single female from Tefé (Amazonas, Brazil) and included in the then created new subfamily of Gonyleptidae, Stygninae. Roewer (1913) established the subfamily Stenostygninae for *Stenostygnus* Simon and *Stenostygnellus* Roewer. Sørensen (1932) erected the family Stygnidae for the Gonyleptidae subfamilies without a common eye mound (Heterostygninae, Phareinae, Stenostygninae and Stygninae). Up to now, *S. pusio* was known only by the holotype. Caporriaco (1951) described *Stenostygnus magnus* from Venezuela.

The study of *Stenostygnus pusio*, especially of the male genitalia, showed me that this species belongs to the Biantidae. The external characters included it in the Caribbiantinae, which is a junior synonym of Stenostygninae.

The specimens studied are deposited in: Museu de Zoologia da Universidade de São Paulo, São Paulo (MZSP); Museu de Ciências Naturais, Porto Alegre (MCN); Museum of Comparative Zoology, Cambridge (MCZ); Muséum National d'Histoire Naturelle, Paris (MNHN); and the National Museum of Natural History, Washington (USNM). All measurements are in millimeters.

Biantidae Thorell

Biantidae Thorell 1889: 670; Sørensen, 1932: 224; Martens, 1978: 358; Shear, 1982: 107.

Diagnosis.—Cephalothorax almost as wide as abdomen. Eye mounds separate. Chelicera segment I smooth, condyle-like. Tarsi III-IV with or without scopulae; without tarsal process. Pe-

nis with titillators and conductors; stylus long and thin.

Subfamilies included.—Biantinae, Dibuninae, Stenostygninae and Zairebiantinae. However, the opiliologists are not unanimous as regards composition of the subfamilies of the Biantidae. Roewer (1923) considered all subfamilies as members of Phalangodidae, Sørensen (1932) considered Dibuninae as a family, but Martens (1978) and Shear (1982) did not consider Caribbiantinae (now Stenostygninae) as a Biantidae and finally, Martens (1978) considered Dibuninae as a Phalangodidae member.

Stenostygninae Roewer

Stenostygninae Roewer 1913: 163; 1923: 459; Mello-Leitão 1932: 418.

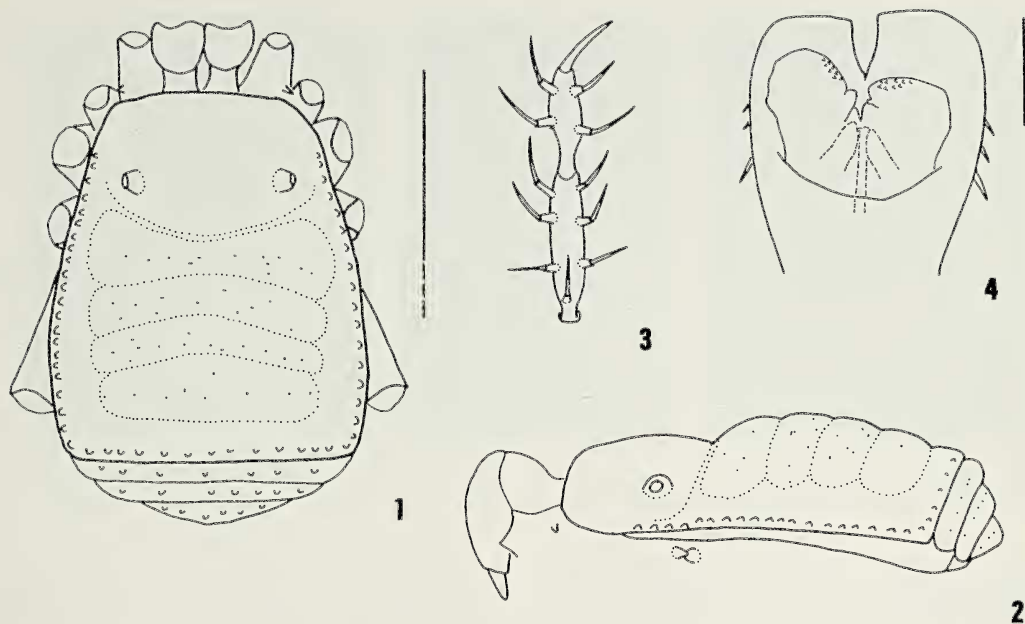
Caribbiantinae Silhavy 1973: 133; Avram 1977: 123.SYN. N.

Diagnosis.—Eye mounds near groove I. Four areas on dorsal scute, area I with or without median groove. Male chelicera swollen or not swollen. Pedipalps long and thin; dorsally unarmed; coxa conical; patella with or without mesoapical seta. Tarsi III-IV with scopulae of spatulate hairs; claws smooth and opposite; distitarsus I with three and II with four segments. Metatarsus III spindled. Penis without membranous region in the ventral plate.

Stenostygnus Simon

Stenostygnus Simon: 1879: 219, 224; Roewer 1913: 163; 1923: 460; Mello-Leitão 1932: 418 (type species: *Stenostygnus pusio* Simon 1879, by monotypy).

Diagnosis.—Differs from the other Stenostygninae genera by the lack of spines or prominent



Figures 1-4.—*Stenostygnus pusio* Simon, female holotype. 1, Habitus, dorsal view; 2, Lateral view; 3, Ventral view of left pedipalp, tibia and tarsus; 4, Dorsal view of distal part of penis. Scale bar: Figs. 1-3 = 1.0 mm; Fig. 4 = 0.5 mm.

tubercles on dorsal scute; male chelicera not swollen; pedipalpal patella without apical setae; male tarsus I with 8 segments, instead of 5-7.

Stenostygnus pusio Simon
Figs. 1-7

Stenostygnus pusio Simon 1879: 224; Roewer 1913: 163, fig. 71 (redescription); 1923: 460, fig. 578 (redescription); Mello-Leitão: 1923: 133 (citation); 1932: 419 (redescription). (holotype female "Teffé, coll. Simon, Paris, n° 4007, type" MNHN, examined).

Male description.—(USNM). *Measurements:* Dorsal scute 1.54 long, 1.22 wide; cephalothorax 0.66 long, 1.10 wide. Chelicera: segment II 0.66 long, III 0.22 long. *Dorsal scute:* (Figs. 1, 2). Cephalothorax and eyes mounds smooth. Anterior margin slightly raised laterally. Areas I-IV undivided and with minute tubercles. Lateral margin with one row of large tubercles from coxa III to posterior margin. Posterior margin with one row of large tubercles, median row of tubercles smaller. Free tergites I-III with one row of small tubercles. Anal opercle tuberculate. *Venter:* Coxae I-III with minute tubercles, lacking apically; coxa IV smooth. Stigmatic area smooth, long; stigmatae concealed; free sternites with one transversal row of minute tubercles. Anal opercle tuberculate. *Chelicera:* Segment I smooth, II not

swollen; chelicera fingers with teeth. *Pedipalps:* Coxa with two ventral tubercles; trochanter smooth; femur straight, without ventrobasal tubercle; patella swollen at apical third; tibia (Fig. 3) with one ventrobasal seta and three longer setae on each side. Tarsus (Fig. 3) with two long setae on each side. *Legs:* Long, straight and thin. Patella IV with three prolateral tubercles and one dorsoapical. Tarsal claws smooth, double and lying perpendicular to the axis of the leg. Scopulae dense on last segment, with spatulate hairs. Tarsal segmentation: 8(3), 12(4), ?, 6. The specimens examined lacked the third pair of legs. *Penis:* (Figs. 5-7). Ventral plate with an apical cleft "U" shaped; with five retrolateral pairs of setae and two subapical ventral pairs of bifid setae. With titillators; stylus and conductors concealed by the titillators. *Coloration:* Brownish, pedipalpus yellowish.

Female supplemental description (holotype).—*Measurements:* Dorsal scute 1.40 long, 1.92 wide; cephalothorax 0.52 long, 1.16 wide. Chelicera: segment II 0.52 long, III 0.26 long. (Measurements of appendages in Table I.)

Female similar to the male. Lateral margin of dorsal scute with a row of large tubercles from coxa II to posterior margin. Patella IV without tubercles. Tarsal segmentation: 6(3), 9(3), 6, 6.



Figures 5–7.—*Stenostygnus pusio* Simon. Scanning electron micrographs of distal part of penis (USNM). 5, Dorsal view; 6, Lateral view; 7, Ventral view. Scale bar = 0.2 mm.

Type locality.—Tefé, Amazonas, Brazil (03°22'S - 64°42'W).

Distribution.—Recorded from Amazon basin (Colombia, Ecuador and Brazil). All records were made from localities near the tributaries of Amazon/Solimões river. Roewer (1913, 1923) recorded the “type” as being from Cayenne (French Guiana) and a second specimen, not belonging to the type series, from Tefé (Brazil). I examined the holotype and it was labeled “Teffé” as in Simon’s description. There are no other specimens of *S. pusio* in the MNHN, and I think that Roewer was mistaken.

Material examined.—**BRAZIL.** Amazonas: Tefé, ♀ holotype (MNHN); Solimões River, 30 April 1966, 3♂ (USNM); Alto Solimões, 20 December 1979, A. Lise leg, 1♀ (MCN). **COLOMBIA.** Amazonas: Amacayacu (National Park 48 km NW from Leticia, 03°48'S, 70°16'W), 90–100 m, 3 October 1985, 1♀ (MCZ). **ECUADOR.** Napo: Pompeya (Napo river), May 1965, Peña leg, 1♀ (MCZ).

DISCUSSION

Simon (1879) described *Stenostygnus pusio* within the Gonyleptidae, subfamily Stygninae. Simon’s subfamily, characterized by the lack of a common eye mound, was divided by Roewer (1913) into four separate subfamilies: Heterostygninae, Phareinae, Stenostygninae and Stygninae. Stenostygninae was established for two monotypic genera, *Stenostygnellus* (with one species, *S. flavolimbatus* Roewer 1913) and *Stenostygnus*. Later, the following genera and species were described in the Stenostygninae: *Bunistygn-*

nellus beebei Goodnight & Goodnight 1949; *B. macrochelis* Roewer 1916; *B. ornatus* Roewer 1943; *Dichobunistygnus ephippiatus* Roewer 1915; *Hoplostygnus albicinctus* Roewer 1915; *Stenostygnellus praetiosus* Caporiacco 1951; *Xanthostygnus fractus* Mello-Leitão 1949 and another species of *Stenostygnus* (*S. magnus* Caporiacco 1951).

During the review of the family Stygnidae (Pinto-da-Rocha unpubl. data), I examined the holotype and some other specimens of *S. pusio*. I didn’t observe a tarsal process on legs III–IV and from the examination of the genitalic features, I concluded that there is no evidence to place *Stenostygnus* in the Stygnidae. Simon (1879) stated that the holotype had a well developed pseudonygium (= tarsal process) and pectinate claws, but I observed only a long hair and smooth claws. The presence of a tarsal process is synapomorphic for Cranidae + Gonyleptidae + Cosmetidae + Stygnidae (Kury 1992). The tarsal process is historically an important feature to distinguish the families of Gonyleptoidea without the common eye mound: Podoctidae/Biantidae/Stygnommatidae (tarsal process absent) from Stygnidae (present). However, some species of Stygnidae have secondarily lost the tarsal process (e. g., *Auranus*, *Pickeliana*, unpubl. data). The genitalic features (presence of titillators) confirm the position of *S. pusio* in Biantidae.

The Biantidae are currently divided in four subfamilies: Biantinae, Stenostygninae (= Caribbiantinae), Dibuninae and Zairebiantinae. Biantinae have scopulae, four areas on dorsal scute and parallel claws; Stenostygninae have four

Table 1.—Appendage measurements of the female holotype of *Stenostygnus pusio* Simon. Tr = trochanter, Fe = femur, Pt = patella, Ti = tibia, Mt = metatarsus, Ta = tarsus. Measurements are in mm.

	Tr	Fe	Pt	Ti	Mt	Ta	Total
Leg I	0.16	1.40	0.32	1.00	1.48	0.92	5.28
II	0.26	3.36	0.44	2.96	4.60	1.76	13.38
III	0.20	2.28	0.36	1.20	2.50	0.78	7.32
IV	0.26	3.20	0.48	1.62	3.96	0.82	10.34
Pedipalp	0.22	1.10	0.64	0.56	—	0.40	2.92

areas, scopulae and opposite claws; Dibuninae have three areas, no scopulae and parallel claws. Zairebiantinae seem not to be a Biantidae because the eyes are placed on two distinct mounds close to each other and located in the middle of the cephalothorax (Kauri 1985) instead of far apart and near the line I. Unfortunately, the genitalia of *Zairebiantes microphthalmus* are poorly known and the drawing of Kauri (1985, fig. 249) is difficult to relate to any other family/subfamily of the Gonyleptoidea. There are no cladistic hypotheses for Biantidae subfamilies; but I believe that opposite claws and spindled metatarsi III are synapomorphic for the Stenostygninae. The presence of a membranous region ventrally in the ventral plate (Schwellkörper of Martens 1978, 1986) and the small number of articles in tarsi I (usually three) are synapomorphic for the Biantinae. The genitalia of the Dibuninae species are unknown. Members of the Stenostygninae have been recorded from the Antilles (Šilhavý 1973; Avram 1977), the Biantinae are recorded from the Oriental region (Roewer 1923; Martens 1978) and the Ethiopian region (Roewer 1923; Rambla 1982; Kauri 1985) and the Dibuninae from the Oriental region (Roewer 1923). *Stenostygnus pusio* is the first species of Biantidae recorded from Brazil, Colombia and Ecuador and is the second known representative of the family in South America. Gonzalez-Sponga (1992) recorded an unidentified species from Venezuela (specific locality not mentioned).

Stenostygnus pusio is closely related to the “Caribbiantinae” by presence of opposite claws and large number of articles on tarsi I; and it lacks the membranous region ventrally on ventral plate (plesiomorphic). Another synapomorphy of the Stenostygninae, male metatarsi III spindled, couldn’t be observed in *S. pusio* because all males studied were without third legs.

The convergences between some Biantidae and some Stygnidae are remarkable. Those of note are the opposite claws (Stenostygninae, Heter-

ostygninae), scopulae with spatulate hairs (Biantinae, Stenostygninae, Heterostygninae), last tarsal article III–IV flattened (Stenostygninae, Heterostygninae), eye mound divided and situated back in the cephalothorax, dorsal scute rectangular/slightly elliptical, and pedipalpal coxae/femur/patella lengthened.

Based on the convergences mentioned (that are synapomorphic for Heterostygninae) and by the presence of male genitalia with slender ventral plate and posterior claws pectinated, the other genera and species formerly placed in the Stenostygninae are transferred to the Heterostygninae. *Stenostygnus magnus* Caporiacco will be the type species of a new genus of Heterostygninae (Pinto-da-Rocha unpubl. data).

ACKNOWLEDGMENTS

I am grateful to Dr. Arturo Muñoz-Cuevas (Muséum National d’Histoire Naturelle) for sending me the holotype of *S. pusio*, to Dr. Adriano B. Kuri (Universidade do Rio de Janeiro), Dr. Sônia Casari (Museu de Zoologia da Universidade de São Paulo) and James C. Cokendolpher for suggestions on the manuscript. I am also grateful to Dr. Alberto A. G. F. C. Ribeiro, head of the Laboratório de Microscopia Eletrônica (Instituto de Biociências da Universidade de São Paulo) and to Márcio V. Cruz for the help in the use of the electron microscope. This study was supported by a grant from Fundação de Amparo a Pesquisa do Estado de São Paulo (#91/4054-7).

LITERATURE CITED

Avram, S., 1977. Recherches sur les opilionides de Cuba III. Genres et espèces nouveaux de Caribbiantinae (Biantidae, Gonyleptomorphi). Résultats Exp. Biospéol. Cubano-Roumaines á Cuba, 2:123–136.

Caporiacco, L. di. 1951. Studi sugli Aracnidi del Venezuela raccolti dalla Sezione di Biologia (Universida Centrale del Venezuela). I Parte: Scorpiones, Opi-

- liones, Solifuga y Chernetes. Acta biol. Venezuelica, 1:1-46.
- Gonzalez-Sponga, M. A. 1992. Arácnidos de Venezuela. Opiliones Laniatores II. Familia Cosmetidae. Biblioteca de la Academia de Ciencias Físicas, Matemáticas y Naturales, Caracas, vol. 26, 432 pp.
- Kauri, H. 1985. Opiliones from Central Africa. Ann. Mus. r. l'Afrique Centrale, 8° série, 245:1-168.
- Kury, A. B. 1992. The genus *Spinopilar* Mello-Leitão, 1940, with notes on the status of the family Tricommatidae (Arachnida, Opiliones). Steenstrupia, 18:93-99.
- Martens, J. 1978. Opiliones aus dem Nepal-Himalaya. IV. Biantidae (Arachnida). Senckenbergiana Biol., 58:347-414.
- Martens, J. 1986. Die Grossgliederung der Opiliones und die Evolution der Ordnung (Arachnida). Actas X Congr. Int. Aracnol. Jaca/España, I:289-310.
- Mello-Leitão, C. F. 1923. Opiliones Laniatores do Brasil. Arq. Mus. Nac. Rio de Janeiro, 24:105-197.
- Mello-Leitão, C. F. 1932. Opiliões do Brasil. Revta Mus. Paulista, 17 (2° parte):1-505, + 61 plates.
- Rambla, M. 1982. Contributions a l'étude de la faune terrestre des îles granitiques de l'archipel des Seychelles. Opiliones (Arachnida). Ann. Mus. Royal L'Afrique Centrale, 8° série, 242:86.
- Roewer, C. F. 1913. Die Familie der Gonyleptiden der Opiliones-Laniatores. Arch. Naturg., 79A:1-256.
- Roewer, C. F. 1923. Die Weberknechte der Erde. Systematische Bearbeitung der bisher bekannten Opiliones. Jena, Gustav Fischer. 1, 116 p.
- Shear, W. 1982. Opiliones. Pp. 104-110, vol.2 In Synopsis and classification of living organisms. (S. P. Parker, ed.). McGraw-Hill Book Co., New York.
- Šilhavý, V. 1973. Two new systematic groups of gonyleptomorphid phalangids from the Antillean-Caribbean region, Agoristenidae fam. n. and Caribbiantinae subfam. n. (Arachn.: Opilionidea). Vestník Československe Spol. Zool., 37:110-143.
- Simon, E. 1879. Essai d'une classification des Opiliones Mecostethi. Ann. Soc. Entomol. Belgique, 22: 183-241.
- Sørensen, W. 1932. Descriptiones Laniatorum (Arachnidorum opilionum Subordinis). Kongl. Danske Vidensk. Selsk. Skr. Naturvidensk. Math. Afd. (København), (9) 3 (4):199-422.
- Thorell, T. 1889. Aracnidi Artrogastri Birmani raccolti da L. Fea nel 1885-1887. Ann. Mus. Civ. Stor. Nat. Genova, 27:521-729.

Manuscript received 31 October 1994, revised 6 June 1995.